Claims

We claim:

1. A composite part having an integrated flow channel, comprising:

an elongated foam core;

a flow channel media attached to said elongated foam core and extending along a first elongated side thereof, said flow channel media defining interstices for the passage of resin;

at least one fabric layer secured to said elongated foam core, and enclosing said first elongated side of said foam core, including said flow channel media, to define a resin flow path along said first elongated side.

2. The composite part according to claim 1 wherein said fabric layer further encloses at least a second and third elongated side of said foam core, each of said second and third elongated sides adjoining said first elongated side.

3. The composite part according to claim 1 further comprising fabric tab portions extending from said second and third elongated sides.

4. The composite part according to claim 1 further comprising a second flow channel media attached to said elongated foam core and extending along a second elongated side thereof, said flow channel media defining interstices for the passage of resin.

5. The composite part according to claim 4 wherein said fabric layer encloses said second elongated side of said foam core, including said flow channel media, to define a second resin flow path along said second elongated side.

6. The composite part according to claim 5 wherein said second elongated side is opposed from said first elongated side.

7. The composite part according to claim 1 wherein said flow channel media is bounded by a second fabric layer interposed between said foam core and said flow channel media.

8. The composite part according to claim1 wherein said second fabric layer is a substantially closed fabric for preventing a passage through said second fabric of said foam core into said flow channel media.

9. The composite part according to claim 1 wherein said flow channel medium is a three-dimensional plastic matrix.

10. The composite part according to claim 9 where said flow channel medium is between about 50 to 90% open space.

11. A method of making a composite part with an integrated flow channel, said method comprising the steps of:

arranging a fabric layer in a configuration constrained against outward movement and defining a cavity between opposing surfaces thereof;

arranging a flow channel media adjacent at least one of said opposing surfaces;

dispensing a predetermined amount of a self-expanding, self-curable, uncured structural foam into said cavity, said foam expanding and curing in said cavity at a

molding pressure determined by said predetermined amount of said foam and thereby attaching itself to said fabric layer and said flow channel media to form said composite structure;

freeing said cured composite structure from said constraint of said arranging step.

12. A method as in claim 11 wherein said fabric layer is made from one of the group consisting of glass fiber, carbon fiber, aramid fiber, linear polyethylene or polypropylene fiber, and polyethylene fiber.

13. A method as in claim 11 wherein said fabric layer is comprised of organic or inorganic fibers.

14. A method as in claim 11 wherein said fabric layer is comprised of polyester staple mat, glass fiber mat, organic fiber mat and inorganic fiber mat.

15. A method as in claim 11 wherein said structural foam is a two-part, self-expanding, self-curing urethane foam, and a molding pressure of said foam is controlled so that said foam penetrates at least partially into interstices of said fabric as it expands and cures.

16. A method as in claim 11 further comprising the step of covering at least a portion of said flow media with a second fabric layer prior to adding said foam to said cavity, said second layer of fabric substantially preventing said foam from penetrating into said flow media.

17. A method as in claim 11 wherein said flow channel media is a three dimensional plastic matrix

18. A method as in claim 17 wherein said flow channel media comprises between about 50% to 95% open space.